

Appl. No.: 09/975,168  
Amdt. dated 10/21/2005  
Reply to Official Action of June 16, 2005

### **REMARKS/ARGUMENTS**

This communication is filed in response to the second, non-final Official Action for the above-identified patent application. The second Official Action now rejects Claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,717,795 to Sharma et al., in view of the publication S.V. Kartalopoulos, *Introduction to DWDM Technology: Data in a Rainbow*, IEEE Press 41, 42 (2000) (the "Kartalopoulos publication"). The second Official Action then rejects the remaining claims, namely Claims 21-26, as being unpatentable over the Sharma patent in view of the Kartalopoulos publication, and further in view of U.S. Patent No. 4,089,584 to Polczynski. As explained below, Applicants respectfully submit that the claimed invention of the present application is patentably distinct from the Sharma patent, the Kartalopoulos publication and the Polczynski patent, taken individually or in combination. As such, Applicants respectfully traverse the rejection of Claims 1-26 as being unpatentable over the Sharma patent in view of the Kartalopoulos publication; and the rejection of Claims 21-26 as being unpatentable over the Sharma patent, in view of the Kartalopoulos publication and Polczynski patent. In view of the remarks presented herein, Applicants respectfully request reconsideration and allowance of all of the pending claims of the present application.

#### ***I. Claims 1-20 are Patentable over Sharma/Kartalopoulos***

As explained in response to the first Official Action, in contrast to the system of independent Claim 1, and as conceded by the first and now second Official Actions, the Sharma patent does not disclose a multimode network bus. Nonetheless, the first and now second Official Actions allege that, as the Sharma patent discloses the use of a multimode light source, it would have been obvious to have used the multimode light source in the embodiment disclosing the other features of Claim 1 since multimode light sources are less expensive than single-mode light sources. Further, the second Official Action now alleges that the Kartalopoulos publication discloses a multimode optical fiber and that such a fiber has advantages over single-mode optical fiber in splicing and light coupling. Thus, the second Official Action alleges that it would have been further obvious to one skilled in the art to implement a multimode fiber, as disclosed by the



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Kartalopoulos publication, in the system disclosed by the Sharma patent, to disclose the claimed invention.

**A. Multimode light source of Sharma is not synonymous with the Multimode network bus of the Claimed Invention**

As explained in response to the first Official Action, the multimode light source of the Sharma patent is not synonymous with the multimode network bus (e.g., fiber optic system) of the present invention, as understood by those skilled in the art. Initially, Applicants note that the second Official Action indicated that the aforementioned distinction explained in response to the first Official Action is moot in view of the new combination of the Sharma patent and the Kartalopoulos publication. However, as the Detailed Action section of the second Official Action continues to maintain the obviousness of multimode transmission in the Sharma system due to its disclosure of a multimode *laser* source, Applicants reiterate their position put forth in response to the first Official Action. Sharma patent, Figures 6 and 7, and col. 6, lines 37-60.

Generally, the Sharma patent discloses a multimode light source. As explained below, however, a multimode light source does not require a multimode network bus. More particularly, the Sharma patent discloses that the multimode light source emits *laser* light "corresponding to a plurality of longitudinal modes at a fixed wavelength interval." Sharma Patent, col. 6, ll. 42-43 (emphasis added). Thus, the multimode of the light source disclosed by the Sharma patent refers to the longitudinal mode to produce multiple wavelengths and multiple frequencies.

As readily understood by those skilled in the art, a multimode network bus transmitting *optical* signals, as recited by independent Claim 1, operates in multiple transverse modes. For each transverse mode, a standing wave is established in a direction normal to the direction of propagation, where higher mode optical signals are generally characterized by sharper guiding angles and a smaller propagation constant in the direction of propagation, as compared to lower mode optical signals. The mode of the network bus recited by independent Claim 1 refers to the transverse mode which, because the network bus is multimode (generally having a larger waveguide diameter), permits multiple standing waves to be established in a direction perpendicular to the direction of propagation.



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For the sake of illustration, consider that a light source operating at multiple longitudinal modes such as in the manner disclosed by the Sharma patent may produce light at multiple frequencies. In the visible light range of the electromagnetic spectrum, these multiple frequencies may correspond to multiple colors of light. In contrast, a multimode network bus such as that recited by the claimed invention permits propagation of multiple transverse modes, which in the case of colors of light, refers to the bus permitting propagation of multiple waves of a single color of light down the length of the bus

Applicant therefore respectfully submits that even considering the multimode light source disclosed by the Sharma patent, the Sharma patent does not teach or suggest a multimode network bus, as recited by independent Claim 1 of the present application.

***B. Single-Mode Fibers in Telecommunications Systems***

As also explained in response to the first Official Action, the Sharma patent does not explicitly define its network as being single mode or multimode. The Sharma patent discloses the use of related network systems being proposed for optical telecommunication. As is well known to those skilled in the art, due to increased modal dispersion in multimode waveguides, optical telecommunication networks are most typically, if not exclusively, implemented using single mode waveguides. Moreover, as shown and described with respect to FIGS. 8, 9 and 10 of the Sharma patent, the network nodes of various embodiments of the Sharma system include optical circulators (see, e.g., optical circulators 618, 6111 of FIG. 8). It is also well known to those skilled in the art that optical circulators are primarily used with single mode waveguides. Therefore, the Sharma patent does not suggest the multimode network bus of independent Claim 1.

In response to the above remarks, the second Official Action indicates that such remarks cannot take the place of evidence in the record, and further that the Sharma patent does not disclose or suggest one type of fiber over another. Applicants respectfully submit, however, that remarks explaining that the use of multimode fibers in telecommunications applications is contrary to accepted wisdom in the art are not of the type requiring evidence in the record. See MPEP § 716.01(c) II. (explaining that attorney statements for which evidence is required include



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"statements regarding unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant").

Again, and in contrast to the assertion that the Sharma patent does not suggest one type of fiber over another, Applicants respectfully submit that the totality of the prior art suggests that the use of multimode fibers in telecommunications systems is contrary to accepted wisdom in the art. As disclosed in column 1, lines 40-45 of U.S. Patent No. 4,776,655 to Robertson, for example, the majority of optical fiber used in telecommunications as of 1985 (i.e., the foreign priority filing date of the Robertson patent) was monomode (i.e., single mode) optical fiber. In this regard, one of the principle problems with the use of multimode optical fibers for telecommunications is the limit modal dispersion imposes on the information carrying capacity of such fibers. U.S. Patent No. 3,957,343 to Dyott et al., column 1, lines 18-21 (foreign priority filing date of 1972). As explained in U.S. Patent No. 5,011,247 to Boudreau et al. (filed 1990), "[m]any telecommunications applications use single-mode optical fiber because of the superior bandwidth arising from its reduction of mode partition noise.... Multimode optical fiber is of little value for telecommunications because it suffers from mode-partition noise when used for high speed transmissions over a distance." Column 1, lines 37-46. *See also* U.S. Patent No. 4,957,342 (column 1, lines 46-62) and 5,024,504 (column 1, lines 36-51) both to Boudreau et al. (and further explaining that technology for aligning multimode optical fibers in an array is not acceptable for telecommunications).

Applicants respectfully submit that, considering the totality of the prior art, the use of multimode optical fiber in telecommunications systems is contrary to accepted wisdom in the art. As the Sharma system is disclosed with reference to telecommunications systems, the Sharma patent thereby suggests its network bus is a single-mode network bus, as opposed to a multimode network bus, as in the claimed invention.

### ***C. Combination of Sharma/Kartalopoulos***

Even if it could be asserted (albeit incorrectly) that the Sharma patent does not teach or suggest a particular type of optical fiber, the second Official Action alleges that the



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Kartalopoulos publication discloses multimode fiber, and that it would have been obvious to one skilled in the art to combine the teachings of the Kartalopoulos publication with the Sharma patent to disclose the claimed invention. Applicants respectfully submit, however, that one skilled in the art would not be motivated to modify the Sharma patent to include the multimode fiber of the Kartalopoulos publication. The Sharma system is disclosed with reference to telecommunications systems, and the use of multimode fiber in telecommunications systems is contrary to accepted wisdom in the art. The Sharma patent therefore teaches away from the use of multimode fiber, such as that disclosed by the Kartalopoulos publication, in the disclosed telecommunication system. See MPEP § 2145 X.D.2. (explaining that "[i]t is improper to combine references where the references teach away from their combination").

Applicants therefore respectfully submit that, in contrast to independent Claim 1 of the present application, neither the Sharma patent nor the Kartalopoulos publication, individually or in combination, teach or suggest the network system of independent Claim 1, and by dependency Claims 2-6. As such, Applicants respectfully submit that the network system of Claims 1-6 is patentably distinct from the Sharma patent and the Kartalopoulos publication, taken either individually or in combination. Applicants also respectfully submit that the transceiver and method of independent Claims 7 and 12, respectively, also recite a multimode network bus for transmitting optical signals. Thus, Applicants also respectfully submit that the transceiver of independent Claim 1, and by dependency Claims 8-11, and the method of independent Claim 12, and by dependency Claims 13-20, are patentably distinct from the Sharma patent and the Kartalopoulos publication, taken individually or in combination, for at least the same reasons given above with respect to independent Claim 1. Applicants further respectfully submit, then, that the rejection of Claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over the Sharma patent in view of the Kartalopoulos publication, is overcome.

## ***II. Claims 21-26 are Patentable over Sharma/Polczynski/Kartalopoulos***

As indicated above, the Official Action rejects independent Claim 21, as well as dependent Claims 22-26, as being unpatentable over the Sharma patent, in view of the Polczynski patent and further in view of the Kartalopoulos publication. More particularly, in a



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manner similar to that of independent Claim 1, the Official Action alleges that the Sharma patent in view of the Kartalopoulos publication discloses an optical network system including a multimode network, a multiplexer, a plurality of remote devices and a demultiplexer. However, as conceded by the Official Action, the Sharma patent does not disclose the network for use in a vehicle, which the Official Action alleges is disclosed by the Polczynski patent. The Official Action continues by alleging that it would have been obvious to use the optical network of the Sharma patent in a vehicle as disclosed by the Polczynski patent to provide the benefits of immunity to electromagnetic interference and obviate the need for radiation shielding for the vehicle.

As explained above with respect to independent Claim 1, neither the Sharma patent nor the Kartalopoulos publication, individually or in combination, teaches or suggests an optical network including a multimode network bus. In fact, the Sharma patent appears to disclose that its optical network is a single mode network, or at the very least teaches away from use of a multimode network bus. Even if it could be suggested that the Polczynski patent disclosed a multimode network bus, Applicants respectfully submit that as the Sharma patent teaches away from use of a multimode network bus. One skilled in the art would not be motivated to modify the Sharma system to include the multimode bus of the Polczynski patent. Applicants therefore respectfully submit that none of the Sharma patent, Polczynski patent or Kartalopoulos publication, individually or in combination, teach or suggest the claimed invention of independent Claim 21.

Moreover, Applicants respectfully submit that there is no motivation for combining the Sharma patent, Polczynski patent and Kartalopoulos publication. As alleged by the second Official Action, one skilled in the art would be motivated to incorporate the Sharma system in the vehicle disclosed by the Polczynski patent to provide the benefit of immunity to electromagnetic interference (EMI), eliminating the need for radiation shielding within the vehicle. As disclosed by the Polczynski patent, however, the alleged benefits realized by combining the Sharma system in the Polczynski vehicle are realized by the use of fiber optic networks over electrical networks, without regard to whether such fiber optic networks are single-mode or multimode networks. Since the Polczynski system individually already



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implements such a fiber optic network, the Polczynski system already benefits from immunity to EMI and thus the eliminated need for radiation shielding. Similarly, since the Sharma system individually already implements such a fiber optic network, the Sharma system already benefits from immunity to EMI and thus the eliminated need for radiation shielding. Thus, since both the Sharma and Polczynski systems already individually benefit from immunity to EMI and eliminated need for radiation shielding, one skilled in the art would not be motivated to modify either system to achieve the aforementioned benefits.

Applicants therefore respectfully submit that the claimed invention of independent Claim 21 is patentably distinct from the system and method of the Sharma patent, Polczynski patent and Kartalopoulos publication, taken individually or in combination. As dependent Claims 22-26 each depend, directly or indirectly, from independent Claim 21, Applicants also respectfully submit that dependent Claims 22-26 are patentably distinct from the system and method of the Sharma patent, Polczynski patent and Kartalopoulos publication for at least the same reasons given above with respect to independent Claim 21. Applicants further respectfully submit, then, that the rejection of Claims 21-26 under 35 U.S.C. § 103(a) as being unpatentable over the Sharma patent, in view of the Polczynski patent and further in view of the Kartalopoulos publication, is overcome.



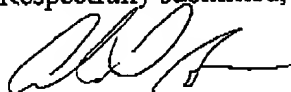
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### CONCLUSION

In view of the remarks presented above, Applicants respectfully submit that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

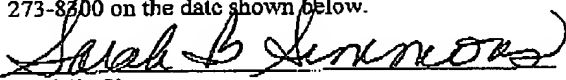



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